



Roses: Back on the Menu



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Feeding Symptoms: Stippling

- White or yellow spots, known as stippling, result when certain foliage feeders pierce leaf tissue with their mouthparts and remove cell sap.
- **Examples:** plant bugs, lace bugs, leafhoppers, spider mites, eriophyid mites and whiteflies



Spider Mites

- Mites have tiny mouthparts modified for piercing individual plant cells and removing the contents.

Spruce Spider Mite



Southern Red Mite



Two-Spotted Spider Mite



Spider Mite Mouthpart



Two-Spotted Spider Mite

- Development from egg to adult:
- 8.3 days at 77 - 95°F (night-day)
- 28.2 days at 50 - 68°F (night-day)



True Bugs - Hemiptera

- Hemiptera usually have four wings folded flat over the body.
- There is often a visible triangle on the back, at the base of the wings called the **scutellum**.
- The front pair are thickened and leathery at the base with membranous tips or ends.
- Mouthparts are formed for piercing and sucking and the beak arises from the front part of the head.
- Hemiptera go through gradual metamorphosis.



Homoptera

(Aphids, Whiteflies, Leafhoppers, Scale, Mealybugs, Cicadas)

- Homoptera may or may not have wings.
- Wings, when present, are four in number and are held roof-like over the body and are usually membranous.
- Mouthparts are formed for piercing and sucking and the beak arises from the hind part of the head.
- All Homoptera feed on plants.
- Metamorphosis is generally considered to be gradual, but it is modified in whiteflies and some other Homoptera.



With Homoptera, the beak arises from behind the head and almost directly beneath the eyes.



Aphids

- If wrinkled rose buds and puckered, curling new leaves appear on your roses, aphids are your primary suspects.
- Aphids feed on very young succulent shoots, causing curled, stunted or puckered leaves, and yellowing leaves that fall from stems and misshapen blooms with streaked petals.
- Aphids may also transmit serious diseases to plants.



Whiteflies

- Despite their name, whiteflies are not true flies, but are in the order Hemiptera, related to aphids, scales and mealybugs.
- They feed on very young succulent shoots, causing leaf yellowing, leaf distortion and leaf death.
- The sweetpotato whitefly is a common pest of roses.



Leafhoppers

- Leafhoppers are active, elongate, somewhat wedge-shaped insects.
- They have piercing-sucking mouthparts and readily run, hop, or fly when disturbed.
- Leafhoppers may also transmit serious diseases to plants.



Leafhopper Rose Damage



Scale Insects

- Scale insects are one of the most destructive groups of insects that attack ornamental plants.
- Scale insects are divided into two groups, soft scale and hard scale.
- Sooty mold is often associated with only soft scale insects.

Soft Scale



Hard/Armored Scale



Armored or Hard Scale

- Do not produce honeydew
- Thus, no sooty mold
- They have a protective waxy armor or cover that is separate from the body of the insect



Scale Insects

- Several species of armored scale occur on roses, with rose scale being one of the more common.
- Their bodies are covered with a hard scale-like covering, that may be round, elliptical, tear-shaped, or oyster shell-shaped, depending on species.
- Eggs are laid in July or early August and hatch in August to September.

Rose Scale



Oystershell Scale on Rose



Two-sided sticky tape applied to infested stems is an excellent way to detect egg hatch.



Thrips

- Thrips are extremely small, brown insects usually living and feeding inside of the blooms.
- A deformed flower with flecked or scratched petals is usually a sign of a thrips problem.
- Thrips are especially attracted to yellow or light-colored roses.



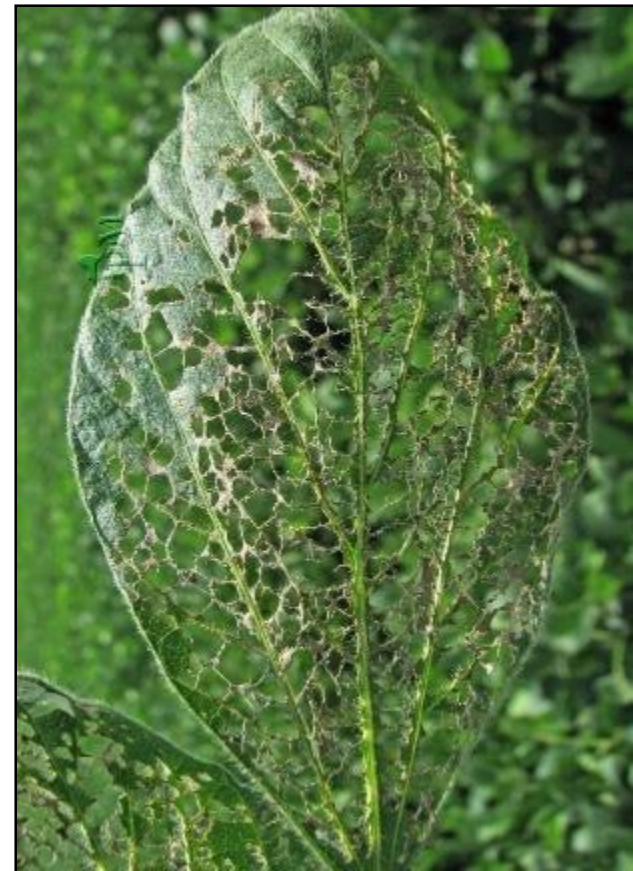
Thrips Damage

- Various thrips species feed on roses. Two of the most common are flower thrips and western flower thrips.
- Thrips damage to bud and within the bloom.
- Thrips punctured the very immature leaves causing curling.



Feeding Symptom: Holes in Leaves

Notches cut from leaf margins, circular holes cut from leaf margins, small randomly scattered holes in leaves, and skeletonizing of foliage are symptoms of chewing insects such as **beetles**, **weevils**, **caterpillars**, and **sawfly larvae**.



Beetles - Coleoptera

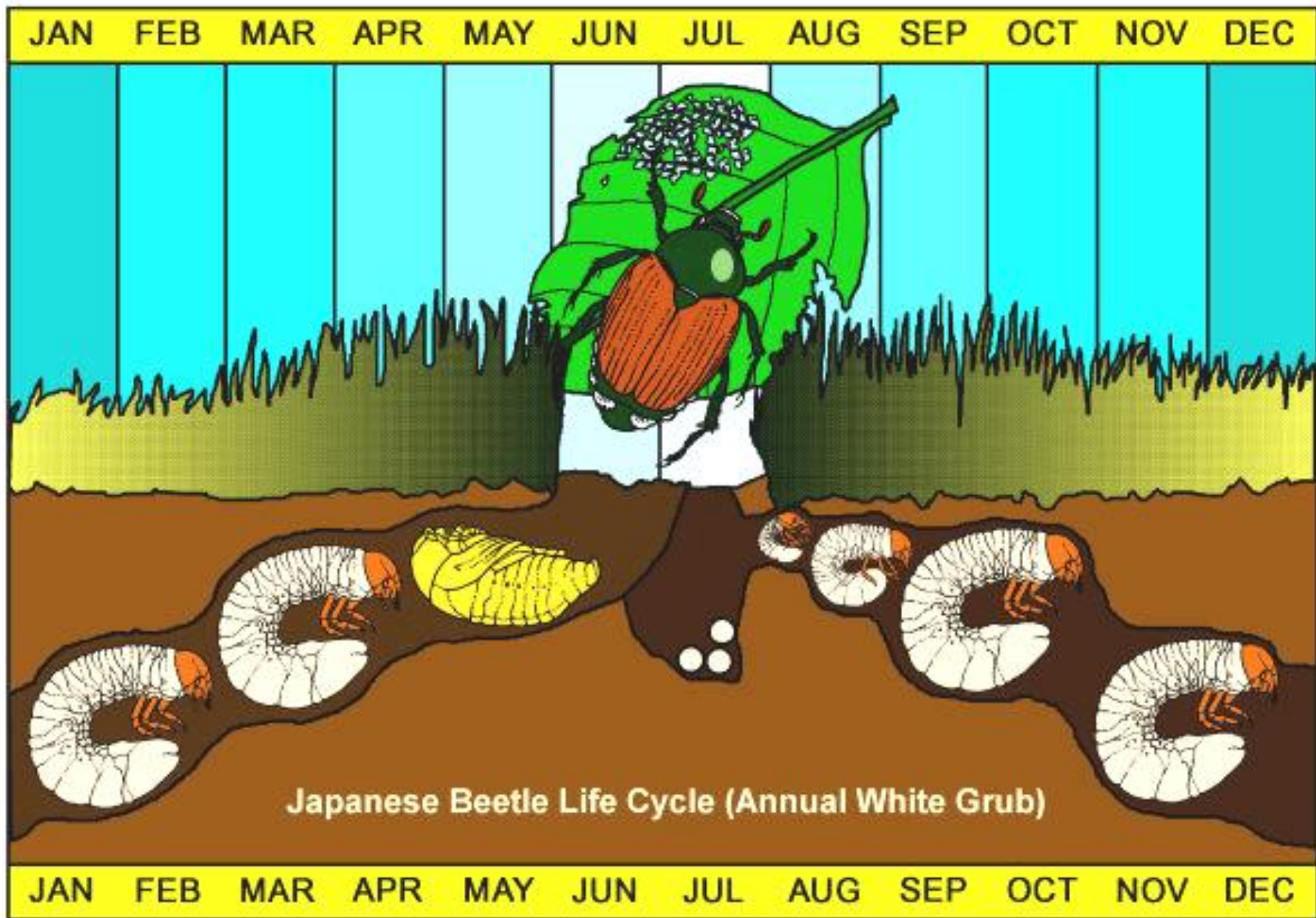
- Coleoptera is the largest order by number of species.
- Beetles usually have two pairs of wings.
- With most beetles, the front pair of wings are thick and form a hard shell over the abdomen.
- The hind wings are membranous and are folded under the front wings when at rest.
- The mouthparts are generally for chewing.
- Beetles go through complete metamorphosis.



Japanese Beetles

- Since the first detection in the United States in a nursery near Riverton, New Jersey in 1916, it has spread to many states east of the Mississippi River.
- Japanese feed on over 300 different species of plants.
- To control adults, one of two very safe pesticide, pyrethrum or Neem, can be applied in two applications, 3 to 4 days apart, to help control the problem.





Rose Chafer

- Rose chafers feed on flower blossoms, especially peonies and roses, from which they get their name.
- These beetles are attracted to sandy, sunny and grassy areas during their egg-laying period.
- Rose chafers are poisonous if eaten by dogs or chickens.

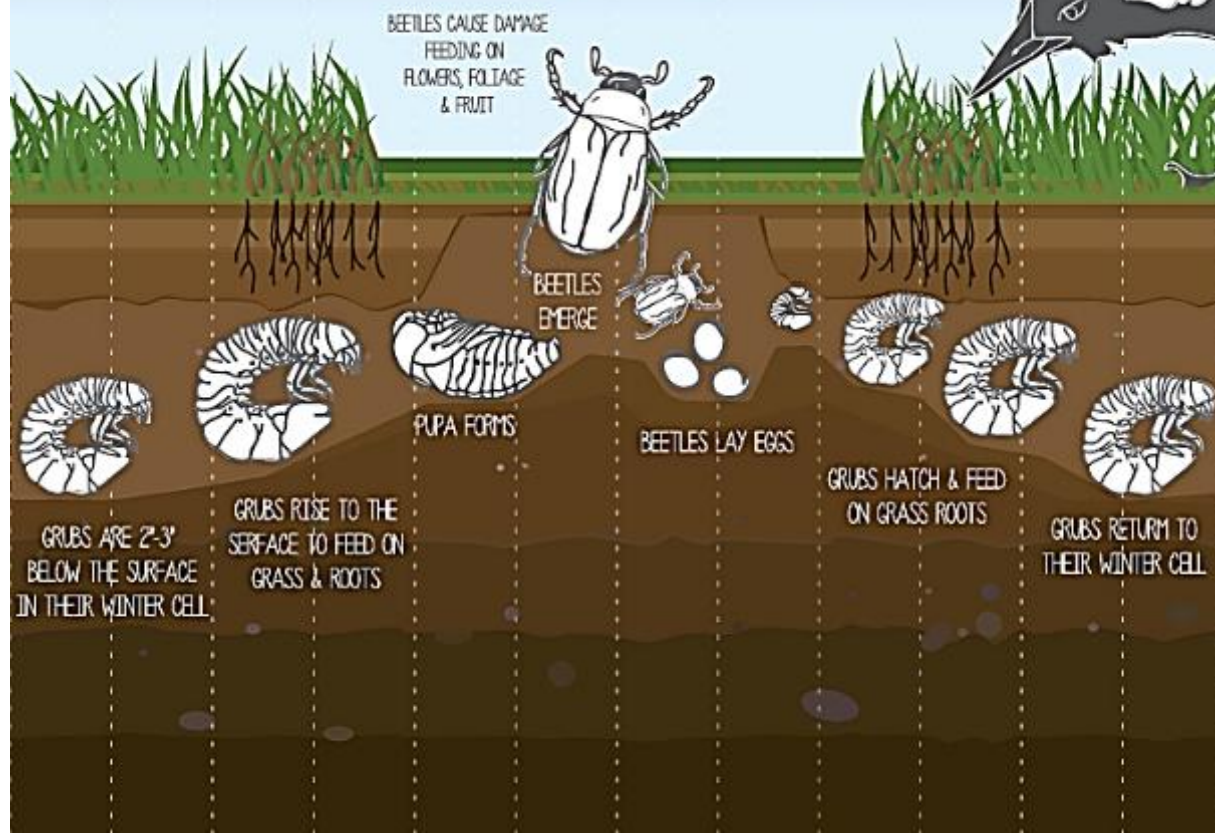


Chafer Beetle Life Cycle

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

PREVENT CHAFER BEETLE INFESTATION:
KEEP YOUR LAWN HEALTHY & COVERED WITH A THICK LAYER OF GRASS

BIRDS, PARTICULARLY MAGPIES & CROWS, BADGERS
& FOXES FEED ON THE CHAFER GRUBS THEY
TEAR UP A LAWN AND CAUSE DAMAGE!



Rose Sawfly (small, non-stinging wasps)

- **Host Plants:** Roses
- **Active:** Most feeding damage occurs from May to July
- **Life Cycle:** Fully-grown larvae drop from the plants and burrow into the soil and remain dormant until spring



- **Host Plant:** Rose
- **Symptoms:** Clear or light tan spots first appear on leaves
- Leaves are skeletonized



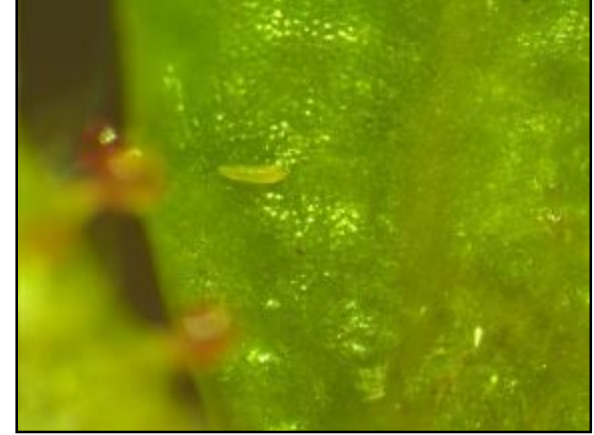
Rose Rosette Disease



Eriophyid mites are the vector
for rose rosette disease and
overwinter on unopened
flower buds.



Rose Rosette Disease



- Rose rosette disease or witches'-broom of rose, is a virus-like disease that is spread by Eriophyid mites.
- **Early symptoms:** A red pigmentation of the underside of leaf veins with increased growth of vegetative shoots
- **Late Symptoms:** Very small leaves, shortened petioles, intensely red shoot, and proliferation of thorns
- **Control the disease by controlling the mite.**
Carbaryl (Sevin), bifenthrin, horticultural oils and insecticidal soap may provide some protection when applied at weekly intervals during the months of **Mid-May, June and July.**

Leaf Cutter Bees

- It is unusual to see these insects at work, but they make their presence known by the perfectly round holes cut near the edges of the leaves.
- The damage they cause is strictly cosmetic and warrants no control.



Leaf Cutting Bees



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Leaf Cutting Bees

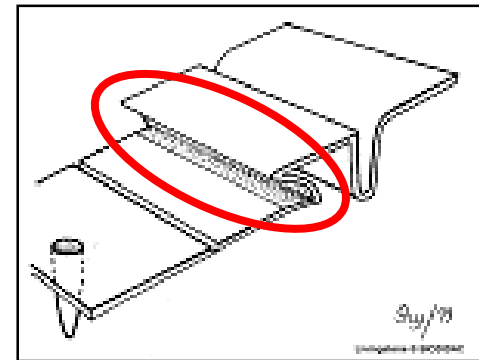
- There are **about 242 species** of leaf cutting bees in North America.
- **Most species are solitary**, but some species will live in small colonies.
- Leaf cutting bees are also important **pollinators of fruits, vegetables, wildflowers, and other crops.**
- They use cut leaves to construct nests in cavities in wood or hollow stems.
- There are even some that nest underground.



Insecticidal Soap

(Water Balance)

- Derived from potassium salts of fatty acids.
- Kills by disrupting the membranes in the inter-segmental fold of the exoskeleton, which causes a lethal loss of body fluids.
- Are **contact** insecticides and have no residual activity.
- **Effective on:** soft-bodied insects, mites, aphids, whiteflies, leafhoppers, scale crawlers, thrips and others



Oils

(Asphyxiation)



- **Dormant Oil** and **Horticultural Oil**.
- Most are mineral oils refined from petroleum.
- Oils coat the insect's cuticle, resulting in **asphyxiation**.
- A pesticide spray that is 96% canola oil is available for anyone who may have a sensitivity to petroleum products.
- **Effective on:** soft-bodied insects, mites, aphids, whiteflies, leafhoppers, scale, thrips, overwintering eggs, and others

When Not to Apply Oils

- Do not apply oils when the temperature exceeds 90° F or falls below 40° F.
- Apply horticultural oil when the relative humidity is less than 65% so the oil can evaporate quickly.



Neem Oil



- A vegetable oil extracted from the seeds of the Asian neem tree (*Azadirachta indica*).
- The insecticidal properties seem to be not from the oil smothering the insect, but from an active ingredient, **azadirachtin**.
- Neem extracts do not instantly kill insects.
- Acts as a **feeding deterrent, growth regulator, oviposition suppressant, sterilant, and toxin**.

Neem Oil

- **Effective on:** Chewing insects more than sucking insects and insects that undergo complete metamorphosis.
- Spider mites, aphids, whiteflies, scale, thrips, lacebugs, sawflies, Japanese beetles, caterpillars, and others
- **Caution:**
- Do not apply to drought stressed plants.
- Do not apply to Japanese maple, horse chestnut or gardenia.





Pyrethrin/Pyrethrum

(Nervous System)



- Pyrethrum is the powdered, dried flower head from the Pyrethrum daisy, *Chrysanthemum cinerariifolium*.
- Pyrethrins interrupt the normal transmission of nerve impulses.
- Rapidly degrade when exposed to light or moisture and do not persist in the environment.
- **Effective on:** soft-bodied insects, aphids, thrips, stink bugs, lace bugs, leafhoppers, caterpillars, and more.

Spinosad

(Nervous System)

- Derived from the fermentation juices of a soil bacterium called *Saccharopolyspora spinosa*.
- Collected from soil in an abandoned rum distillery on a Caribbean Island in 1982.
- Disrupts the insect's nerve impulse transmission causing rapid excitation, paralysis and death.
- **Effective on:** Caterpillars, sawflies, leafminers, lace bugs, leaf-feeding beetles, thrips, spider mites, and more.



Beauveria bassiana

- A naturally occurring soil fungus found throughout the world.
- When spores of this fungus come in contact with the cuticle (skin) of susceptible insects, they germinate and grow directly through the cuticle to the inner body of their host.
- The fungus proliferates throughout the insect's body, producing toxins and draining the insect of nutrients, eventually killing it.



Beauveria bassiana

- **Effective on:** Aphids, thrips, whiteflies, caterpillars, May beetles, Japanese Beetles, wood-boring insects, bark beetles, weevils, grasshoppers and other insects.



Photo by Phil Bendie



Questions?

